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ABSTRACT

Microcomputer use and access, training needs, information sources, and self-perceived knowledge and skills regarding microcomputers were determined with a sample of college of agriculture faculty in 11 land-grant universities. Personal and organizational characteristics related to various levels of using microcomputers were also investigated. Questionnaires were completed in 1985 by 1,157 research, resident instruction and extension faculty who attended colleges and universities that were members of the Northeast Computer Institute. Adoption level was defined as the frequency with which individuals used a microcomputer during the past year and was measured along a continuum from daily use to none at all; high-level users used a microcomputer at least once or twice a week, while moderate-level users' rate was more than once every few months. Findings include: 65% of respondents have access to a microcomputer at work, while 22% have access to one at home; high-level users were more likely to have had a microcomputer for over a year and to have one at home; saving time is the most commonly reported advantage of using the microcomputer; and 78% were interested in receiving training in the use of the microcomputer. (SW)

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ADOPTION OF MICROCOMPUTER TECHNOLOGY BY COLLEGE OF AGRICULTURE FACULTY IN ELEVEN NORTHEAST LAND-GRANT UNIVERSITIES

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ADOPTION OF MICROCOMPUTER TECHNOLOGY BY COLLLEGE OF AGRICULTURE FACULTY IN ELEVEN NORTHEAST LAND-GRANT UNIVERSITIES

STATEMENT OF THE PROBLEM

Objectives of this paper are: 1) to provide descriptive information about the adoption of microcomputers by college of agriculture faculty members at eleven land-grant universities which are members of the Northeast Computer Institute, and 2) to determine personal and organizational characteristics related to various levels of using microcomputers.

The data presented in this paper were collected in a baseline survey as part of the design to evaluate the effectiveness of the Northeast Computer Institute over a five-year period. The general purpose of this Institute is to assist member universities with the adoption of microcomputer technology. In the next section, relevant literature will be reviewed and discussed.

REVIEW OF THE LITERATURE

In the past thirty years, a great deal of research on the process of adoption of various practices and technological advancements has been conducted. Much of this work has focused on how specific attributes of individuals influence adoption decisions (Rogers, 1975; Rogers and Shoemaker, 1971). For example, factors which have been considered to be related to adoption included: educational level, current knowledge and skill level, personality characteristics, and social status (i.e., Becker, 1970; Rogers & Shoemaker, 1971). However, since much of this research has been conducted from very different disciplines and focuses on varied applications, (i.e., Agronomy, Sociology, Entomology, Business, etc.), cross-comparative evidence of the characteristics of early and late "adopters" of innovations remains

inconclusive. We found a limited amount of literature about the process of adoption of microcomputer technology in university settings. However, existing literature does suggest a general framework for understanding the adoption process.

Rogers (1962) delineates five stages of the adoption process: 1) awareness, 2) interest, 3) evaluation, 4) trial, and 5) adoption. The length of time required for an individual to pass through the adoption process from awareness to adoption is referred to as the "adoption period" (Rogers, 1961). Finally, Rogers (1961) describes five "adopter categories" which are differentiated by the length of time it takes for an individual to adopt new ideas. These include: 1) the innovators, 2) the early adopters, 3) the early majority, 4) the late majority, and 5) the laggards.

Gibson and Nolan (198) apply this type of stage model to the adoption of microcomputers in organizations. The authors provide a useful discussion of the growth stages that occur after computers have been implanted into an organization. These include: 1) initiation, 2) expansion, 3) formalization, and 4) maturity.

Ashby (1982) offers a conceptual critique of existing approaches of assessing the process of adoption of new ideas. In her article, she suggests the consideration of: 1) the various contexts (i.e., person, social, regional, geographic, organizational, economic) in which the innovation will be initiated, 2) the appropriateness of the technology under investigation to meet the needs of the population at hand, and 3) the qualitative differences in adoption stages which may preclude the use of quantitative indexes of adoption.

More specific to our purposes here are the results from a study conducted by Cantrell (1982). For her doctoral dissertation, she assessed the extent to

which agricultural and extension educators in Mississippi had used some type of computer; 23% had been exposed to microcomputers, 11% had access to a microcomputer, and the vast majority (96%) were interested in receiving training in microcomputer use. Although this study does provide a descriptive account of several dimensions of microcomputer use (i.e., interest in training, access to and exposure to microcomputers), a distinction is not made between frequent and infrequent users. Additionally, it focuses exclusively on the initial stage of the adoption process, or what Rogers (1962) refers to as Awareness and Interest.

Nieuwsma (1984) conducted a study to determine the factors associated with the utilization of a computer network (AGNET) designed for use by Extension agents in North Dakota. AGNET is used for problem solving, information-sharing, and communication via an electronic mailing system. Her sample included sixty-three North Dakota agricultural extension agents, (which represents a 95% response rate). To assess characteristics associated with differences in levels of use of AGNET, three groups were defined by the number of hours extension agents were logged on AGNET for December, 1982, January, 1983, and February, 1983. High users reported using AGNET over twenty hours per month, medium users used AGNET for 10-19 hours, and low users used AGNET from one to nine hours.

Nieuswma (1984) discovered that high users were more likely to report having previous computer training and to report having received encouragement and support by administrators, specialists, and clientele. Additionally, high users were more likely to be younger and to have less years of service at their position than medium or low users.

McGonigal (1984) conducted a study which focused on the adoption of computer technology by 120 New York State Cooperative Extension agricultural

agents. In a brief report of her findings, she concludes that "adopters:" 1) cannot be differentiated by age, 2) have greater access to computer equipment, 3) possess higher levels of job satisfaction than "non-adopters," 4) are better integrated into organization, training, and professional systems, 5) perceive a greater value of technology to their clientele, and 6) are found in all job classifications. (Unfortunately, McGonigal does not discuss how she operationalized her key constructs--the adoption process and adopters). Based on additional findings, McGonigal (1984) concludes that the context most likely to foster computer adoption can be described as one: 1) which allocates adequate resources, 2) in which individuals perceive that the value of technology to their clientele is great, and 3) in which a link between adoption of job responsibility can be made. This type of conceptual work adds an important dimension to studies based exclusively on descriptive accounts of the characteristics of adopters in that it attempts to isolate factors which inhibit or facilitate the adoption process.

Using a sample of 101 participants in a microcomputer extension program in Nebraska during 1982 and 1983, Jose (1984) discovered that the most frequently mentioned applications for which a microcomputer would be purchased include aid in the preparation for financial and livestock records and for budgeting. However, the vast majority of respondents do not currently own a microcomputer (91%). Of those respondents who do have access to a microcomputer, slightly over half indicate that they spend about as much time on business activities now as they did without the microcomputer. In terms of the sources of information from which respondents receive information about microcomputers, one-third of the respondents report learning about microcomputers from magazine articles, followed by friends and family members (21%), hardware vendors (9%), advertisements (9%), and Extension meetings

(6%). Books and software vendors were mentioned by less than 5% of the sample. Almost 40% report an interest in buying a microcomputer in the future. Although this study was conducted with a relative small sample, it provides detailed information about current and projected levels of microcomputer utilization in a non-business setting.

METHODOLOGY

Sample

The study population included all resident instruction, research, and extension faculty employed by the Colleges of Agriculture in the eleven land grant universities which belong to the Northeast Computer Institute (NECI). The sampling strategy employed was to randomly select 50% of those individuals in each state. In West Virginia and Maine, however, their administrative structure necessitated including some faculty outside the College of Agriculture. In West Virginia, Extension is administered separately, as is the School of Forestry in Maine. The eleven NECI-member universities include: West Virginia University, University of District of Columbia, University of Delaware, State University of New Jersey at Rutgers, University of Connecticut, The University of Vermont, the University of Maine at Orono, The Pennsylvania State University, the University of Massachusetts, the University of Rhode Island, and the University of New Hampshire.

Data Collection Procedures

A ten-page mail questionnaire was designed and piloted with a small sample of resident instruction, research and extension faculty at The Pennsylvania State University, University of Connecticut, West Virginia University, and State University of New Jersey at Rutgers.

In the spring of 1985, questionnaires were sent directly to research, resident instruction, and extension faculty included in the final sample with a cover letter signed by their key relevant college administrator. To insure the maximum response rate possible, three follow-up mailings were sent to respondents who failed to return their questionnaire within a specified time period (according to the Dillman Total Design Method, 1978). All coding, keypunching, and data analysis were performed by faculty and staff at The Pennsylvania State University.

Of the 1,497 questionnaires distributed to the eleven member states of the Northeast Computer Institute, 1,157 were completed and returned. This represents a 77% overall return rate. The majority of questionnaires (61%) were returned before the first follow-up mailing, a postcard reminder sent approximately two weeks after the respondent received the first mailing. Twelve percent were returned before the second follow-up mailing, a letter and an extra copy of the questionnaire. Before the third follow-up mailing, another postcard reminder, 21% of the questionnaires were returned. Only six percent were returned after the third follow-up mailing, a letter and additional copy of the questionnaire.

The questionnaire included questions on microcomputer use and access, training needs, sources of information about microcomputers, self-perception of knowledge and skills regarding microcomputers, and expectations of the Institute.

Characteristics of the Respondents

The majority of respondents have appointments in Extension (60%), while 41% have appointments in research, and 38% in Resident Instruction (see Table 1). Of those in Extension, 61% are located off-campus. Fifty-two percent of the Extension faculty are specialists or agents in Agriculture, 33% in 4-H

Youth Development; 24% in Home Economics/Family Living, 23% in Natural Resource Development, and 22% in Community Resource Development. The majority of respondents are less than 45 years old (56%); 72% are male; 42% have doctorate, and 38% a Master degree, and 52% consider their academic discipline to be Plant or Animal Science.

RESULTS

In this study, adoption level was defined as the frequency with which individuals used a microcomputer within the past year. Respondents who reported using a microcomputer at least once or twice a week were defined as "high-level users." "Moderate-level" users report using a microcomputer more than once every few months. "Never" users have not used a microcomputer at all in the past year.

Table 2. Distribution of Respondents by Level of Microcomputer Usage

Level	Frequency	%
High-level	396	34.4%
Moderate-level	227	19.2%
Never-Users	357	31.0%
	1,157	100.0%

Clearly, this classification scheme provides only a crude indicator of one aspect of the complex process of adoption of microcomputer technology. However, differences in patterns of response for high, moderate, and never users will provide profiles of characteristics of user-types.

Access to and Utilization of Computers

Results are presented regarding respondent's access to and utilization of microcomputers (see Table 3). The majority of respondents (65%) have access to a microcomputer at work. Only 22% have access to a microcomputer at home. Differences in the accessibility of microcomputers were discovered between high-level, moderate-level, and never users. High-level users are more likely to have had a microcomputer for over a year, and to have one at home. Alternatively, moderate-level users report sharing their microcomputer with the most people and are more likely to have gained access to their microcomputer recently (less than six months ago). In terms of microcomputer utilization, high-level users are the most likely to have support personnel working for them (i.e., and secretary, research assistant, graduate students, etc.), to report that their support personnel use microcomputers frequently, and to be highly satisfied with their support staff (see Table 4).

High-level microcomputer users are also more likely to use mainframe computer facilities (university-wide) more frequently than moderate-level or never users. Alternatively, respondents who report never using mainframe computer facilities are most likely to have never used a microcomputer (see Table 5).

Perceived Advantages and Disadvantages

Respondents reported several advantages and disadvantages to microcomputer use (See Table 6). Saving time is the most commonly reported advantage of using the microcomputer (reported by 61% of the respondents). Other commonly mentioned advantages include: it produces a better product (47%), simplifies my work (46%), increases my organization (40%), and increases my skills (29%). Alternatively, commonly reported disadvantages of microcomputers include: it takes too long to learn (25%), it costs too much

(23%), it's an inefficient use of my time (8%), and it's not relevant to my work (6%). Additionally, high-level users mentioned significantly more advantages and fewer disadvantages than moderate-level or never-users ($F=12.4$, $p < .0001$ for the number of advantages; $F=9.7$, $p < .0001$ for the number of disadvantages).

Training

In Table 7, results of questions which assessed respondents interest in training are reported. The majority (78%) report being interested in receiving training in the use of the microcomputer. Of those respondents, most plan to engage in self-training (52%), followed by taking a class (35%), read magazines (23%), and joining a computer club (4%).

In terms of micro-computer applications, two-thirds of the respondents reported that they would like to receive training in software use; followed by graphics (52%), spreadsheet programs (50%), word processing (49%), and statistical packages (46%). Interest in training was much lower for the following microcomputer applications: modeling or simulation (mentioned by 28% of the respondents) and designing computer-based curriculums (18%).

Differences between high, moderate and never users were discovered in reported interest in microcomputer training. Moderate-level users reported the highest interest in training, followed by high-level users and never users. However, high-level users are the most likely to report that they have plans for training. More specifically, individuals who have never used a microcomputer are most likely to plan to take a class, while high-level users are most likely to report planning to read a magazine, engage in self-training, or join a computer club to further their microcomputer knowledge and skill (see Table 8).

Sources of Information about Microcomputers

The most frequently mentioned source from which respondents receive information about microcomputers was knowledgeable peers, which was mentioned by 75% of the respondents (see Table 9). Other frequently mentioned sources include computer support staff (58%), faculty newsletters (53%), and consultants (49%). University courses, professional societies, and computer clubs were mentioned by less than one-fourth of the sample as sources of information about microcomputers. Although the pattern of responses does not differ between the three user groups, high-level users report receiving the most information from all sources.

Adoption Level Related to Training, Knowledge and Skills

The three user groups of microcomputers were related to: 1) the number of applications for which respondents reported an interest in receiving more training, and 2) scores on knowledge about and skills in using microcomputers. Analyses of variance was used to test for significant difference between the three groups on three dimensions.

The first summary score, Training, refers to the number of microcomputer activities for which respondents reported an interest in receiving more training. Possible applications include: use a word processor, use a spreadsheet program, use a data base program, send and receive electronic mail, write a program, design a program, use existing software, design mailing list records, design a computer-based curriculum, use statistical packages, use graphics programs, complete a literature review, and use modeling or simulation programs. To compute the Training scores, the total number of applications a respondent reported was summed. Thus, a score of 4 indicated that an individual was interested in receiving training in four different microcomputer activities or applications. Scores could range from 0 to 13.

Microcomputer Knowledge and Skill scores refer to respondents self-rating of their level of knowledge and skill in using microcomputers. Scores were created by summing responses to nine identical items in each section. Examples of items to which respondents were asked to rate their knowledge and skill level include: 1) how to use computer - assisted instruction, 2) choosing appropriate software, and 3) writing programs. Response choices range from 1-3 (1 = "low," 2 = "medium," and 3 = "high"). An individual who reported their knowledge or skill to be low on all nine items would receive a score of 9. Alternatively, an individual who reported their knowledge or skill to be high on all items would receive a score of 27. Thus, high scorers possess greater knowledge and skill than low scorers. Significant group differences were discovered for knowledge and skill levels (see Table 10). In other words, high-level users report the highest levels of knowledge and skill about microcomputers. A nearO-ignificant difference between user groups was discovered for the Training score.

Demographic Profiles of Microcomputer Users

In the last section, the demographic profiles of high-level, moderate-level, and never users will be described (see Table 11). High-level microcomputer users are most likely to be under the age of 45 and to have an advanced degree. For extension faculty, high users are most likely to be in agriculture-related disciplines. On-campus extension personnel are more likely to be high-level users than off campus personnel. Compared to research and resident instruction personnel, extension faculty are much less likely to use a microcomputer, to have a microcomputer at home, and to plan to buy a microcomputer soon. Finally, males are much more likely to be high-level users than are females (see Table 12).

SUMMARY AND DIRECTIONS AND FUTURE RESEARCH

In this descriptive study, frequency of microcomputer use was used to indicate levels of adoption along a continuum from daily use to having never used a microcomputer. The three groups which were defined, high-level, moderate-level, and never users, demonstrated very different perceptions of and knowledge about microcomputers, plans for receiving training, and access to microcomputers.

Clearly, the individual-level factors assessed in this study do not provide a complete picture of the myriad of influences which affect the process of microcomputer adoption. Organization and institutional factors might include: the microcomputer (hardware and software) and training facilities available to personnel, the percentage of the institutional budget earmarked for computer resources, and the organization's policy related to the purchase, distribution maintenance and update of microcomputers. Without some information about these various contexts which necessarily influence microcomputer adoption at the individual level, definitive conclusions cannot be drawn about what causes differences in microcomputer use and what factors prevent and facilitate microcomputer adoption. A subsequent study of administrators at the eleven land-grant universities which belong to the Northeast Computer Institute will be conducted in the summer of 1985. Combining results from both studies will provide a more complete picture of why differences in levels of adoption exist.

However, several comments about the findings reported in this paper are in order. The recency with which microcomputers have become available at different institutions may be linked to patterns of use. For example, institutions which have facilitated access to microcomputers at an early date may have more high-level users than an institution which recently purchased

its first microcomputer. For some purposes, then, it may prove more useful to assess changes in microcomputer adoption over time within organizations rather than make comparisons between organizations.

The results also suggest that individuals who do not currently use microcomputers have access to the same types and amount of information about microcomputers as very frequent users do. Clearly, factors other than access to information prevent microcomputer utilization for some potential users. Additionally, individuals who never use microcomputers report high levels of interest in receiving training for a variety of microcomputer applications (i.e., data base management, word processing, electronic spreadsheets, etc.). Knowledgeable peers were the most frequently mentioned source of information about microcomputers. This finding suggests that these individuals could play a vital role in training efforts, both in terms of encouraging participation and helping to transfer knowledge and skill into useful tangible rewards.

In conclusion, a strategy for implementing adoption of microcomputers in a University setting would include emphasis on the linear as well as non-linear factors. Making available microcomputer hardward and software should be supplemented by programs to deal with attitudes, knowledge, and skills of the faculty. Anticipated benefits and rewards have motivational consequences. Budgets need to be planned to allocate resources for hardware and software, training, and continuous support as faculty adopt microcomputer technology. The context in which microcomputers are adopted us a system with linear and nonlinear components being interrelated.

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Table 1. Descriptive Characteristics of the Study Sample (N=1157)

Characteristic	Frequency	%
Appointment:		
Extension	696	60
Research	469	41
Resident Instruction	435	38
Program Areas for Extension Personnel:		
Agriculture	367	52
4-H/Youth Development	231	33
Home Economics/Family Living	165	24
Natural Resource Development	163	23
Community Resource Development	152	22
Office Location for Extension Personnel:		
On Campus	259	38
Off Campus	412	61
Academic Discipline:		
Plant Science	318	31
Animal Science	217	21
Social Science	145	14
Home Economics	149	14
Education	102	10
Physical Science	46	4
Food Science	34	3
Years of Position:		
10 years or less	440	41
11-20 years	333	31
Over 20 years	300	28
Degree Earned:		
Bachelor's	196	18
Master's	410	38
Doctorate	466	42
State of Residence:		
Connecticut	71	6
District of Columbia	21	2
Delaware	47	4
Massachusetts	141	12
Maine	107	9
New Hampshire	91	8
New Jersey	159	14
Pennsylvania	288	25
Rhode Island	45	4
Vermont	77	7
West Virginia	101	9

Table 1. (continued)

Characteristic	Frequency	%
Age:		
Under 30	95	8
30-44	525	48
45-54	253	23
55 or older	216	20

Table 3. Access to and Utilization of Microcomputers (N=1157)

	Frequency	%
Microcomputer Access:		
At work	749	65
At home	249	22
Secretary has access	865	75
Frequency of Micro Use Within Past Year:		
Almost daily	219	19
1-2 times/week	177	15
Few times a month	123	11
Once a month	62	6
Once every few months	152	13
Never	357	31
Frequency of Support Personnel's Micro Use Within Past Year:		
Almost daily	104	9
1-2 times/week	93	8
Few times a month	64	6
Once a month	28	2
Once every few months	57	5
Never	95	8

Note: Due to missing values for the items included in this table, the sample size varies from 1065 to 1137.

Table 4. Access to and Satisfaction with Support Staff by Microcomputer Use

	Microcomputer Use					
	High-Level (N=396) %	Moderate-Level (N=337) %	Never-Users (N=357) %	X^2	df	p
Microcomputer Access:						
At Work	89.8	76.4	41.9	206.61	4	.0001
At Home	40.5	18.5	8.7	107.41	2	.0001
Secretary has Access	88.3	87.1	67.0	65.68	4	.0001
Recent Access to a Micro: (withing past year)	41.4	52.9	55.5	35.29	10	.0001
Plan to Buy a Micro	29.4	20.6	8.5	42.19	6	.0001
Share a Micro at Work:	71.8	73.8	37.6	115.79	2	.0001
Do You Have Support Personnel To Aid You with Your Computer Work:	55.9	43.4	35.8	30.23	2	.0001
Satisfaction with Support:						
Satisfied	84.8	87.6	82.5	9.90	6	.1287
Not Satisfied	15.2	12.5	17.5	9.90	6	.1287

Table 5. Frequency of Mainframe Use by Microcomputer Use

Frequency of Mainframe Usage:	Microcomputer Use: High-Level (N=396)	Moderate-Level (N=337)	Never-Users (N=357)
Almost Daily	11.9	1.2	4.4
1-2 Times/Week	10.8	2.2	4.4
Few Times/Month	9.8	7.1	2.8
Once a Month	4.2	4.0	.9
Once Every Few Months	15.3	16.8	7.2
Never	47.9	68.6	80.3

Chi-Square=120.52, df=10, p .0001

Table 6. Perceived Advantages and Disadvantages to Microcomputer Use (N=947)

	Frequency	%
Advantages:		
Saves time	697	61
Produces a better product	537	47
Simplifies my work	524	46
Increases my organization	457	40
Increases my skills	947	29
Disadvantages		
Takes too long to learn	282	25
No disadvantages	271	24
Costs	259	23
Inefficient use of my time	94	8
Not relevant to my work	74	6

Table 7. Interest in Microcomputer Training

	Frequency	%
Interest in Training:		
Yes	899	78
No	160	14
Plans for Training:		
Self-train	597	52
Take a class	397	35
Read magazines	264	23
Join a computer club	43	4
Interest in Training by Application:		
Software use	710	62
Graphics	593	52
Spreadsheet program	572	50
Word processing	560	49
Statistical packages	526	46
Electronic mail	454	39
Designing programs	396	34
Literature reviews	390	34
Writing programs	386	34
Mailing lists	329	29
Modeling or simulation	318	28
Designing computer-based curriculum	201	18

Note: Due to missing values for the items included in this table, the sample size names from 906 to 963.

Table 8. Interest in Microcomputer Training by Microcomputer Use

	Microcomputer Use					
	High-Level (N=396) %	Moderate-Level (N=337) %	Never-Users (N=357) %	X^2	df	p
Respondents Interested in Receiving Training:	87.4	90.0	76.5	26.6	2	.0001
Respondents Who Made Training Plans:	89.1	85.7	62.3	77.78	4	.0001
Type of Training Plans:						
Plan to Take a Class	51.0	51.0	57.9	2.48	2	.2886
Learn from a Magazine	47.3	25.1	27.6	36.15	2	.0001
Self-Training	91.4	77.2	58.8	71.01	2	.0001
Join a Computer Club	8.0	3.8	3.5	6.46	2	.0396

Table 9. Sources of Information about Microcomputers

Sources	Frequency	%
Knowledgeable peers	720	75
Computer support staff	545	58
Faculty newsletter	491	53
Consultants	464	49
Newspapers, TV, radio	410	44
Computer magazines	409	43
Computer training staff	431	41
University in-service	425	41
Private vendor	361	40
Software developers	288	31
Northeast Computer Institute	229	25
University courses	214	23
Professional societies	119	13
Computer clubs	107	12

Note: Due to missing values for the items included in this table, the sample size varies from 911 to 943.

Table 10. Training, Knowledge, and Skill Scores by Microcomputer Use

Score	Overall Mean	Range	Microcomputer Use: High-Level (N=192)	Moderate-Level (N=160)	Never-Users (N=111)	F	p
Knowledge	13.03	1-27	16.3	14.2	12.6	31.10	.0001
Skill	11.91	1-27	15.5	12.9	11.5	36.52	.0001
Training	11.74	0-13	12.04	12.31	12.22	2.82	.06

Note: Only those respondents with no missing data for the variables comprising summary scores were included in this analysis.

Table 11. Demographic Characteristics by Microcomputer Use

Demographic Characteristics	N	%	Microcomputer Use: High-Level (N=396) %	Moderate-Level (N=337) %	Never-Users (N=357) %	X^2	df	p
Age:								
Less than 30	93	9	9.2	8.9	7.8	47.02	9	.0001
30-44 years	517	48	56.2	50.7	36.2			
45-54 years	251	23	20.9	23.7	25.8			
Over 55 years	215	20	13.8	16.6	30.1			
	1066	100	100.0	100.0	100.0			
Appointment:								
Extension	689		31.9	34.3	33.8	86.44	74	.1527
Research	463		47.7	23.5	28.7	100.77	86	.1317
Resident Instruction	430		44.7	27.2	8.3	95.77	88	.2678
State:								
1	70	6	5.1	5.9	7.8	83.02	33	.0001
2	21	2	2.0	.9	2.5			
3	46	4	3.3	5.9	3.6			
4	136	12	11.4	8.3	15.7			
5	106	9	9.3	9.8	8.7			
6	90	8	7.3	8.3	7.8			
7	159	14	17.2	9.5	14.0			
8	284	25	28.3	32.6	15.7			
9	45	4	3.3	4.5	3.9			
10	76	7	7.1	8.0	5.9			
11	101	9	5.6	6.2	14.3			
	1134	100	100.0	100.0	100.0			

Table 12. Microcomputer Use by Gender for Extension Personnel vs. Entire Sample

Demographic Characteristics	N	%	Microcomputer Use: High-Level (N=396) %	Moderate-Level (N=337) %	Never-Users (N=357) %	X^2	df	p
Extension:								
Males	418	64	73.8	55.8	63.9	14.87	2	.0006
Females	235	36	26.2	44.2	36.1			
	653	100						
Entire Sample:								
Males	761	71	79.1	64.1	69.7	21.23	3	.0001
Females	305	29	20.9	35.9	30.3			
	1066	100						